

WHAT IS CLAIMED IS:

1. A semiconductor device, comprising:
 - an integrated circuit chip;
 - a base to which said integrated circuit chip is mounted and connected;
- 5 a plurality of terminals disposed on said base for connection of said integrated circuit chip to the outside;
 - a plurality of metal bumps one formed on each of said plurality of terminals; and
- 10 a supporting frame for fixedly supporting said integrated circuit chip or said base,
 - wherein said base includes a circuit board or a circuit film having a circuit pattern formed on an insulating base.
2. A semiconductor device according to claim 1, wherein said supporting frame is made of a metal material.
3. A semiconductor device according to claim 1, wherein said supporting frame comprises an outer rim, a supporting part disposed separate from and inside of said outer rim for supporting said integrated circuit chip or board, and a plurality of connections for connecting said outer rim and the supporting part.
- 5 A semiconductor device according to claim 3, wherein said outer rim is used as a heat radiator.
4. A semiconductor device according to claim 3, wherein said plurality of connections of said supporting

frame constitute cutting portions which are to be cut when said outer rim is cut away.

6. A semiconductor device according to claim 1, wherein said base comprises a circuit board which is connected through bonding wires to said integrated circuit chip.

7. A semiconductor device according to claim 1, wherein said base comprises said circuit film, which is connected by a metal or a conductive resin to said integrated circuit chip.

8. A semiconductor device according to claim 1, wherein said semiconductor device is partially sealed with an organic material.

9. A semiconductor device according to claim 8, wherein said base comprises a circuit board.

10. A semiconductor device according to claim 9, wherein the whole of said semiconductor device including said integrated circuit chip, that surface of said circuit board to which said integrated circuit chip is mounted and connected electrically, a side of said circuit board, and that surface of said circuit board on which said metal bumps are disposed, are sealed with resin, except for said plurality of terminals.

11. A semiconductor device according to claim 9, wherein the whole of said semiconductor device including said integrated circuit chip, that surface of said circuit board to which said integrated circuit chip is connected electrically, and a side of said circuit

board, are sealed with resin, except for said plurality of terminals and that surface of said circuit board on which said plurality of terminals are disposed.

12. A semiconductor device according to claim 9, wherein the whole of said semiconductor device including said integrated circuit chip, and that surface of said circuit board to which said integrated circuit chip is connected electrically, are sealed with resin, except for said plurality of terminals, that surface of said board on which said plurality of terminals is disposed, and a side of said circuit board.

13. A semiconductor device according to claim 1, wherein said base comprises a circuit film.

14. A semiconductor device according to claim 13, wherein the whole of said semiconductor device including said integrated circuit chip, that surface of said circuit film to which said integrated circuit chip is connected electrically, and that surface of said circuit film on which said plurality of terminals is disposed, are sealed with resin, except for said plurality of terminals.

15. A semiconductor device according to claim 13, wherein the whole of said semiconductor device including said integrated circuit chip, that surface of said circuit film to which said integrated circuit chip is connected electrically, and portions at which said circuit film and said integrated circuit chip are joined together, are sealed with resin, except for said

plurality of terminals and that surface of said circuit film on which said plurality of terminals is disposed.

16. A semiconductor device, comprising:

an integrated circuit chip;

a base having a first surface facing said integrated circuit chip and having a plurality of 5 electrical connections to said integrated circuit chip, a second surface on which a plurality of terminals is disposed, each terminal being connected through a wiring lead to a corresponding one of said plurality of electrical connections, and sides;

10 a plurality of metal bumps one formed on each of said plurality of terminals;

a supporting frame fixedly supporting said base or said integrated circuit chip; and

15 a sealing material sealing at least said integrated circuit chip and said first surface of said base,

at least said metal bumps being exposed without being sealed.

17. A semiconductor device according to claim 16, wherein said base is made of a circuit board or a circuit film.

18. A semiconductor device according to claim 16, wherein said supporting frame is made of a metal material.

19. A semiconductor device according to claim 18, wherein said supporting frame is an integrally formed

- structural member comprising a rim, a supporting part disposed separately from and inside of said outer rim for supporting at least one of said base and said integrated circuit chip, and a plurality of connections for connecting said outer rim and the supporting part.
- 5 20. A semiconductor device according to claim 19, wherein said outer rim remains exposed and functions as a heat radiator.
21. A semiconductor device according to claim 19, wherein said plurality of connections of said supporting frame constitute cutting portions which are to be cut when said outer rim is cut away.
22. A semiconductor device according to claim 16, wherein said base comprises a circuit board which is connected through bonding wires to said integrated circuit chip.
23. A semiconductor device according to claim 16, wherein said base comprises a circuit film, said circuit film being connected by a metal or a conductive resin to said integrated circuit chip.
24. A semiconductor device according to claim 16, wherein said sealing material comprises an organic material.
25. A semiconductor device according to claim 16, wherein said base comprises a circuit board, wherein said sealing material further seals said circuit board up to its sides with said second surface of said circuit board and said bumps remaining exposed.
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26. A semiconductor device according to claim 16,
wherein said base comprises a circuit board, and wherein
said sealing material further seals said circuit board
up to said second surface with said bumps remaining
5 exposed.

27. A semiconductor device according to claim 16,
wherein said base comprises a circuit film, and wherein
said sealing material seals said integrated circuit chip
and portions at which said first surface of said circuit
5 film and said integrated circuit chip are joined
together, with said second surface of said circuit film
and said bumps remaining exposed.

28. A semiconductor device according to claim 27,
wherein said sealing material further seals said circuit
film up to said second surface, with said bumps
remaining exposed.

29. A method of making a semiconductor device,
comprising the steps of:

mounting an integrated circuit chip and a base
on a supporting frame, said base including a circuit
5 board or a circuit film;

electrically connecting the integrated circuit
chip and the base by means of a connecting apparatus;

filling and sealing a predetermined portion of
an assembly of the integrated circuit chip, base and
10 supporting frame with an organic resin; and

forming a plurality of solder bumps one on a
respective one of a plurality of external connection

terminals disposed on the base.

30. A method according to claim 29, wherein the filling and sealing step is performed with a mold.

31. A method according to claim 30, wherein the mold is composed of an upper mold half and a lower mold half, each of which has a recess such that when the upper and lower mold halves hold the assembly therebetween, cavities are formed over the assembly on the side of the integrated circuit chip and on the side of the external connection terminals so that the resin is allowed to flow into the cavities, and wherein said sealing step includes the steps of:

10 holding between the upper and lower mold halves the supporting frame on which the integrated circuit chip and the base are mounted; and

forcing the resin into the cavities,

15 wherein the lower mold half has a plurality of projections, one for each of the plurality of external connection terminals, in the recess thereof so as to avoid adhesion of the resin to the plurality of external connection terminals and to ensure a space for each of the metal bumps.

32. A method according to claim 31, wherein that portion of the lower mold half where the projections are disposed includes a plurality of blocks interlocked with each other, each block having a projection corresponding to an external connection terminal with an air vent being formed on at least one boundary at which any two

blocks adjoin.

33. A method according to claim 31, wherein the respective tops of the projections provided in the lower mold half are covered with an elastic plastic material.

34. A method according to claim 31, wherein the respective tops of the projections provided in the lower mold half are covered with a mold releasing agent.